Memo

To:	Mark Ader, EPA	Project:	0138670020.00005
From:	Natasya Gray	cc:	
Tel:	(206) 342-1760		
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Date:	May 11, 2012		

Subject: **Fill Material Sampling Work Plan**
University of Portland River Campus Property
Portland, Oregon

AMEC Environment & Infrastructure, Inc. (AMEC), is assisting the University of Portland (UP) in design and implementation of removal actions to be undertaken on the UP River Campus Property, located at 5828 North Van Houten Place in Portland, Oregon (the site). This fill material sampling work plan outlines the protocols for testing soil currently stockpiled at the site to assess its suitability for use as backfill material (including as backfill along the shoreline [RS] areas) during the removal action.

BACKGROUND

The removal action is being undertaken by UP in cooperation with the U.S. Environmental Protection Agency (EPA) and pursuant to a Bona Fide Prospective Purchaser Agreement (BFPPA) and Order on Consent for Removal Action, Docket No. CERCLA-10-2007-0027. The Engineering Evaluation/Cost Assessment (EE/CA) was finalized in March 2012 (AMEC, 2012), and design activities have commenced in preparation for anticipated construction later this year. Part of the removal action requires backfill and capping of several areas of the property.

Soil intended for potential use as backfill material has been placed in a large stockpile located in the southeastern portion of the site (Area 3A). The sources of this soil include:

- Soil from previous construction projects: Various projects were completed in 2009 on the UP's main campus, located southeast of the property at the top of Waud Bluff.
- Soil from a City of Portland (City) deep sewer installation project conducted in North Portland in 2009 and 2010: The soil accepted from the City's sewer project (by their contractor Michels Tunneling) came predominantly from depths of over 100 feet below ground surface (bgs) and was therefore considered to be clean fill free of hazardous constituents at concentrations greater than regulatory standards.
- Topsoil from construction of the football field at Portland's Roosevelt High School (Roosevelt) in September 2010: Based on easily accessible historical documents, AMEC concluded that a high school playfield has been present at the source location since at least 1924. AMEC recommended environmental sampling of the soil to confirm its suitability for future use at the site and notified and confirmed with EPA the planned approach for evaluating the soil. Samples of the soil from Roosevelt were analyzed for total metals, pesticides, and herbicides. Based on the results of AMEC's due diligence assessment and input from both the Oregon Department of Environmental Quality and EPA personnel involved with both the River Campus site and Portland Harbor, EPA

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granted conditional approval of importing the soil to the site for future use as backfill material during the removal action.

In May 2011, AMEC issued a memo to EPA outlining protocols to identify and test soil for potential import to be used as part of removal actions to be undertaken by UP (AMEC, 2011). That memo is attached for reference (Attachment 1). To our knowledge, no additional fill material has been imported to the site since the soil testing protocol memo was issued. The purpose of this work plan is to verify whether existing stockpiled soil at the site meets suitability requirements for use as fill material during removal action and redevelopment of the site. This fill material sampling work plan has been prepared in general accordance with the protocol established in AMEC's (2011) memo, the Oregon Department of Environmental Quality (DEQ) *Draft Guidelines for Soil Management Determinations* (DEQ, 2008), and the EPA-approved Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) produced for the 2006 multi-increment sampling (MIS) investigation (AMEC, 2006), which was also later used during the 2009 Data Gaps Investigation.

SOIL CHARACTERIZATION

In accordance with the May 2011 soil testing protocol memo, soil sampling for imported soil will be conducted based on the multi-increment sampling (MIS) (currently referred to as incremental sampling methodology [ISM]) sampling procedures described in the 2006 SAP developed for the site (AMEC, 2006). The general procedures are summarized in this section.

Site Access and Notification

Access arrangements shall be made by AMEC staff with the UP (contact information provided below):

Mr. Paul Luty, Director
Facilities Management and Construction
University of Portland
Email: luty@up.edu
Phone (office): (971) 563-9473
Phone (mobile): (503) 943-8874

Under the terms of the BFPPA, UP shall notify EPA no less than 14 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA shall have the right to take any additional samples deemed necessary, and shall allow UP (or its contractors) to take split or duplicate samples of any samples it takes as part of EPA's oversight of the project.

Sample Collection and Preparation

ISM is a structured composite sampling and processing protocol that reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a volume of soil targeted for sampling. ISM provides representative samples of specific soil volumes defined as decision units (DUs). Numerous (typically 30 – 100) increments of soil are collected, and these increments are combined, processed, and subsampled according to specific protocols.

Sample collection and preparation methodologies, including quality control measures to be used to complete these tasks, were developed in accordance with the EPA-approved SAP and QAPP produced for the 2006 MIS sampling investigation (AMEC, 2006). These documents were also relied upon for the 2009 Data Gaps Investigation. AMEC has also relied upon technical and regulatory guidance for ISM prepared by the Interstate Technology & Regulatory Council (2012) in the development of the sampling methodology.

Field Sampling Techniques

For the purposes of this work plan, the DU to be sampled will consist of the large soil stockpile located in the southeastern portion (Area 3A) of the site. Soil samples will be collected from 30 locations on the surface of the stockpile using a systematic random sampling approach with a starting location determined using a random number generator.

Field staff will attempt to utilize a step-probe or hand-auger sampling tool to obtain cylindrical or core-shaped increments of a constant depth of approximately 6 inches from the surface of the stockpile; however, depending upon the nature of the soil encountered, a hand-operated tool, such as a trowel or spoon, may be utilized. Care will be taken to obtain a core-shaped increment regardless of the sampling tool used. Each increment soil sample will be placed in a pre-cleaned, laboratory-provided sample container.

Sample Identification and Labeling

Each increment soil sample will be labeled with the sample location identifier, date and time of sample collection, and sampler's initials. The unique sample location identifier for individual increment soil samples will be generally consistent with previous incremental sampling at the site, using the format PFS-XX(Y)-ZZ, with PFS denoting "parent fill sample", XX indicating the investigation area (which will be Area 3A for all samples), Y indicating the depth interval (which will be the "A" horizon, representing 0 to 6 inches in depth across the DU for all samples), and ZZ indicating the sample number within the investigation area.

Sample Containers and Preservatives

A total of 30 increment samples will be collected from the soil stockpile. Each individual increment sample will be placed into a laboratory-provided, unpreserved 8-ounce sample jar with a Teflon lid. Sample jars will be placed in individual resealable plastic bags and placed in a pre-cleaned, laboratory-provided HDPE sample cooler with ice and bubble wrap. All sample jars will be unpreserved.

Sample Preparation/Processing

The ISM approach relies on homogenization of the sample so that the multi-incremental sample is representative of the sampling surface for the DU. Homogeneity is achieved through grinding the entire multi-incremental sample to a finer size and thoroughly mixing the resulting fine-grained material. ISM samples will be submitted to Analytical Resources, Inc. (ARI) in Tukwila, Washington under chain of custody procedures. ARI will prepare the ISM samples in accordance with SOP-4 included in Attachment A-1 to the QAPP produced for the 2006 MIS sampling investigation (AMEC, 2006), which was also used for the 2009 Data Gaps Investigation. The sample preparation protocol consists of the following steps:

- Upon receipt of all 30 increment samples from the DU, samples will be air-dried for up to two days. Soil from each 8-ounce jar will be ground in a jaw crusher to a maximum size of 2 millimeters. Each sample will be thoroughly mixed after grinding using a decontaminated stainless steel spoon.
- Ground soil from each increment sample will be split into two aliquots: an ISM sample and a parent sample. Approximately 6 ounces of each ground sample will be placed in a new jar to serve as the parent sample. Approximately 2 ounces of each ground sample will be transferred into a large, clean stainless steel bowl. This process will be repeated for all 30 samples in the DU, and the 30 ground increment samples will be thoroughly mixed in the stainless steel bowl using a large stainless steel spoon to represent the ISM sample. After mixing, the ISM sample will be transferred to a 1-liter jar for subsequent analysis.
- The jaw crusher and laboratory equipment will be decontaminated prior to grinding the first samples, but decontamination will not be required between samples within the same DU.

Decontamination and Disposal Methods

Soil sampling equipment will be decontaminated prior to field sampling activities. The soil sampling equipment will be decontaminated using the following three-step wash/rinse cycle:

1. Potable water containing a dilute solution of Alconox will be sprayed onto the sampling device and scrubbed with a brush. Overspray and drippings will be contained in a 5-gallon polyethylene bucket.
2. A second spray of Alconox solution will be used to remove soil from the sampling equipment.
3. A third spray of distilled or deionized water will be used to rinse the equipment.

All clean sampling equipment that is not intended to be used immediately will be wrapped in a layer of aluminum foil to minimize inadvertent recontamination. The decontamination fluids in the bucket will be decanted from the solids and stored in an appropriately labeled drum for disposal as waste.

Analytical Methods

ISM samples from the on-site soil stockpile will be analyzed by the following constituents:

- Diesel- and motor oil-range petroleum hydrocarbons by Northwest Method NWTPH-Dx,
- Gasoline-range petroleum hydrocarbons by Method NWTPH-Gx,
- Polychlorinated biphenyls (PCBs) by EPA Method 8082,
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270M-SIM,
- Total and dissolved lead and arsenic by EPA Method 6010B/6020, and
- Dioxins by EPA Method 1613B.

All sample collection and analysis will be completed in general accordance with the QAPP produced for the 2006 MIS sampling investigation (AMEC, 2006). Analytical data will be reported with a standard laboratory data and quality control package. In addition, the laboratory will provide written certification stating that the sample grinding and homogenization were performed in accordance with SOP-4.

All laboratory data will undergo data quality review (DQR) by qualified and experienced environmental chemists so that project-specific data quality objectives (DQOs) are satisfied. For the purposes of this task, raw data will not be reviewed or validated.

Quality control activities associated with field and laboratory sampling, processing, and analysis will be performed in general accordance with the QAPP produced for the 2006 MIS sampling investigation (AMEC, 2006).

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The suitability of imported soil will be evaluated based on the following applicable or relevant and appropriate requirements (ARARs) that have been established for the site or by the DEQ. Site-specific cleanup levels are described in detail in the EPA-approved EE/CA developed for the site (AMEC, 2012).

The substantive provisions of the EPA Regional Screening Levels, as published in *EPA Regional Screening Levels for Recreational Soil Exposures, 2009* (EPA, 2009), and at the EPA website (EPA, 2010) are applicable requirements for imported material to be used at the site. In particular, screening levels for recreational use are applicable, because the site will not be used for residential purposes.

The River Shoreline areas need to comply with the Portland Harbor PRGs dated March 27, 2009, due to the potential for contaminated soils to migrate or be released from the shoreline into river sediments. Because they are sediment-based, the Portland Harbor PRGs are in some cases more stringent than the Oregon Cleanup rules and other ARARs.

Soil screening level values summarized in region-specific *DEQ Clean Fill Screening Table(s)* (included by reference in the DEQ *Guidelines for Soil Management Determinations,* (DEQ, 2008) are applicable requirements for imported material to be used at the site.

The applicable provisions of the State of Oregon DEQ, *Risk-Based Decision Making (RBDM) for the Remediation of Petroleum Contaminated Sites,* as published on the DEQ website (DEQ, 2010), especially the risk-based concentrations (RBCs) for commercial/industrial use, are applicable requirements for imported soil to be used at the site.

If the stockpiled soil is found to meet the ARARs listed above, it may be utilized at the site without restrictions. If sample results show that concentrations of constituents of concern in the soil exceed screening values, then the material does not meet the management criteria. Depending on the extent to which the material does not meet ARARs, the material may still be used at the site and managed by capping or otherwise establishing, with approval of the site EPA Project Manager, that no complete exposure pathway exists from the imported soil to groundwater or surface water.

REPORTING

A memorandum summarizing the results of the protocol outlined above will be prepared to document the analytical results and the suitability of stockpiled soil for use as backfill material during removal actions at the site. The document will be provided to the EPA for review. Final approval for use will be obtained from the EPA prior to use of the material at the site.

REFERENCES

AMEC, 2006, Sampling Investigation Work Plan and Sampling And Analysis Plan, Triangle Park Property, Portland, Oregon: Prepared for the University of Portland, Portland Oregon, October.

AMEC, 2011, Revised Soil Testing Protocol for Potential Imported Soil, University of Portland River Campus Property, Portland, Oregon: Memo from Gary Dupuy to Mark Ader, EPA, May 17.

AMEC, 2012, Revised Engineering Evaluation/Cost Analysis, University of Portland River Campus Property, Portland, Oregon: Prepared for the University of Portland, Portland, Oregon, March 28.

DEQ (Oregon Department of Environmental Quality), 2008, Draft Guidelines for Soil Management Determinations, December 10.

DEQ, 2010, Risk-Based Decision Making (RBDM) for the Remediation of Petroleum Contaminated Sites (available at http://www.deq.state.or.us/lq/rbdm.htm), accessed September.

EPA (U.S. Environmental Protection Agency), 2009, EPA Regional Screening Levels for Recreational Soil Exposures.

EPA, 2010, Regional Screening Levels for Chemical Contaminants at Superfund Sites, calculator (available at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm), accessed September 20.

EPA/DEQ (U.S. Environmental Protection Agency and Oregon Department of Environmental Quality), 2007, Portland Harbor Joint Source Control Strategy, Table 3-1: Screening Level Values for Soil/Stormwater Sediment, Stormwater, Groundwater, and Surface Water, July 16 (available at http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/docs/JSCSFinalTable03_1.pdf).

Interstate Technology & Regulatory Council, 2012, Technical and Regulatory Guidance, Incremental Sampling Methodology, prepared by The Interstate Technology & Regulatory Council Incremental Sampling Methodology Team. February.

Attachment 1 Revised Soil Testing Protocol for Potential Imported Soil

Cc: Project File

ATTACHMENT 1

Revised Soil Testing Protocol for Potential Imported Soil

Memo

To:	Mark Ader, EPA	Project:	0138670020.00001
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Tel:	(206) 342-1760		
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Date:	May 17, 2011		

Subject: **Revised Soil Testing Protocol for Potential Imported Soil**
University of Portland River Campus Property
Portland, Oregon

AMEC Geomatrix, Inc. (AMEC), has prepared this proposed soil testing protocol on behalf of the University of Portland (UP) for identifying and testing soil for potential import to be used as part of the removal actions to be undertaken on the UP River Campus Property (the site). This protocol was prepared following Oregon Department of Environmental Quality (DEQ) *Draft Guidelines for Soil Management Determinations* (2008). Procedures outlined by the site-specific work plan and sampling and analysis plan (SAP) developed for the site (AMEC 2006a, 2006b) have also been followed to develop this protocol.

AMEC will evaluate soil for potential import to the site on behalf of UP by following this protocol. AMEC will notify US Environmental Protection Agency (EPA) 14 business days prior to initiating a characterization or sampling effort. AMEC will report in writing to EPA its findings on any and all imported soil relative to its meeting the protocol criteria. EPA shall approve or disapprove any such written request for permission to import soil.

IMPORTED SOIL SOURCE IDENTIFICATION

Potential imported soil sources will be identified by UP or by other parties. General information on the potential imported soil sources will be relayed to AMEC. The following information will be requested:

- Source location;
- Volume of material;
- Composition of material (soil, sod, wood debris, etc.);
- Results of any prior testing of material and methods of sampling; and
- Preferred timing for material to be moved.

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DUE DILIGENCE

Once an imported soil source has been identified, due diligence on the material will be conducted as follows.

AMEC will identify any immediate red flags that would make the material unsuitable for the site. These considerations include whether the soil was generated at an obviously contaminated site, provides too little volume to justify the cost of due diligence that would be required, or is otherwise highly unsuitable (e.g., consisting of inappropriate materials, such as rock). If red flags are identified, the imported soil testing process will be discontinued for that potential source.

If the imported soil is considered likely to be suitable, AMEC will perform further due diligence using readily available information regarding the source property. Due diligence will include a review of aerial photographs and an internet search of relevant historical information (such as Sanborn maps). This information will be used to determine any historical uses that could have posed a threat to contaminate the property, or to identify specific areas of the property from which material is inappropriate or should not be accepted. In addition, the due diligence will focus on identifying particular constituents for which the imported soil should be sampled prior to being accepted.

MATERIALS CHARACTERIZATION

Prior to UP's agreeing to accept any potential imported soil, AMEC field personnel will verify and document the location of the source material and the procedures being used to remove it. Field staff will also collect a sufficient number and volume of samples to characterize the material. The soil sampling program for the imported soil will be conducted based on the multi-increment sampling (MIS) procedures described in the SAP for the site (AMEC, 2006b). A simplified work plan for use at potential source properties will be produced for review by EPA prior to implementing this protocol.

The Work Plan will be used as a template for each site being evaluated for obtaining borrow material as fill for the UP site. A simple table of samples and specific analytes to be tested will be determined based on constituents that may be present due to current or historical activities, based on prior information known about the material and source property. Naturally occurring metals will also be included in the analysis irrespective of historical site uses.

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The suitability of imported soil will be evaluated based on the following applicable or relevant and appropriate requirements (ARARs) that have been established for the site or by the DEQ. Site-specific cleanup levels are described in detail in the draft Engineering Evaluation/Cost Assessment (EE/CA) developed for the site (AMEC Geomatrix, Inc., 2010).

The substantive provisions of the EPA Regional Screening Levels, as published in *EPA Regional Screening Levels for Recreational Soil Exposures, 2009*, and at the EPA website

http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm, are applicable requirements for imported material to be used at the site. In particular, screening levels for recreational use are applicable, because the site will not be used for residential purposes.

The applicable provisions of the EPA/DEQ (2007) *Portland Harbor Joint Source Control Strategy*, especially the Source Control Screening Level Values (SLVs) defined therein, are applicable requirements for areas of the site adjacent to the river. Those SLVs will be met to the extent practicable in any imported soil to be used in those areas.

Soil screening level values summarized in region-specific *DEQ Clean Fill Screening Table(s)* (included by reference in the *DEQ Guidelines for Soil Management Determinations, 2008*) are applicable requirements for imported material to be used at the site (DEQ, 2008).

The applicable provisions of the State of Oregon DEQ, *Risk-Based Decision Making (RBDM) for the Remediation of Petroleum Contaminated Sites,* as published on the DEQ website *http://www.deq.state.or.us/lq/rbdm.htm*, especially the risk-based concentrations (RBCs) for commercial/industrial use, are applicable requirements for imported soil to be used at the site (DEQ, 2010).

If the potentially imported soil is found to meet the ARARs listed above, it may be utilized at the site without restrictions. If sample results show that the soil exceeds screening values, then the material does not meet the management criteria, and may be subject to solid waste regulations. Depending on the extent to which the material exceeds ARARs, the material may still be used at the site and managed by capping or otherwise establishing, with approval of the site EPA Project Manager, that no complete exposure pathway exists from the imported soil to groundwater or surface water.

REPORTING

A memorandum summarizing the results of the protocol outlined above will be prepared to document information and analytical results for any imported material identified for acceptance and use. The document will be provided to the EPA for review. Final approval for each imported soil source will be obtained from the EPA prior to use of the material at the site.

REFERENCES

AMEC (AMEC Earth & Environmental), 2006a, GY Method Investigation Work Plan and Sampling and Analysis Plan, Triangle Park Property, Portland, Oregon: Prepared for the University of Portland, Portland Oregon, September.

AMEC, 2006b, Sampling Investigation Work Plan and Sampling And Analysis Plan, Triangle Park Property, Portland, Oregon: Prepared for the University of Portland, Portland Oregon, October.

AMEC Geomatrix, Inc., 2010, Draft Engineering Evaluation/Cost Analysis, University of Portland River Campus Property, Portland, Oregon: Prepared for the University of Portland, Portland, Oregon, November 1.

DEQ (Oregon Department of Environmental Quality), 2008, Draft Guidelines for Soil Management Determinations, December 10.

DEQ, 2010, Risk-Based Decision Making (RBDM) for the Remediation of Petroleum Contaminated Sites, accessed September (available at http://www.deq.state.or.us/lq/rbdm.htm).

EPA, 2009, EPA Regional Screening Levels for Recreational Soil Exposures.

EPA, 2010, Regional Screening Levels for Chemical Contaminants at Superfund Sites, calculator, accessed on September 20 (available at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm).

EPA/DEQ (US Environmental Protection Agency and Oregon Department of Environmental Quality), 2007, Portland Harbor Joint Source Control Strategy, Table 3-1: Screening Level Values for Soil/Stormwater Sediment, Stormwater, Groundwater, and Surface Water, July 16 (available at http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/docs/JSCSFinalTable03_1.pdf).